



WHAT are VOLCANOES, EARTHQUAKES, avalanches, and more...





First published in 2008 by
The Energy and Resources Institute
TERI Press
Darbari Seth Block, IHC Complex, Lodhi Road, New Delhi - 110 003, India
Tel. 2468 2100/4150 4900, Fax: 2468 2144/2468 2145
India +91 ■ Delhi (0)11
Email: teripress@teri.res.in ■ Website: <http://bookstore.teriin.org>

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| ISBN 978-81-7993-159-2

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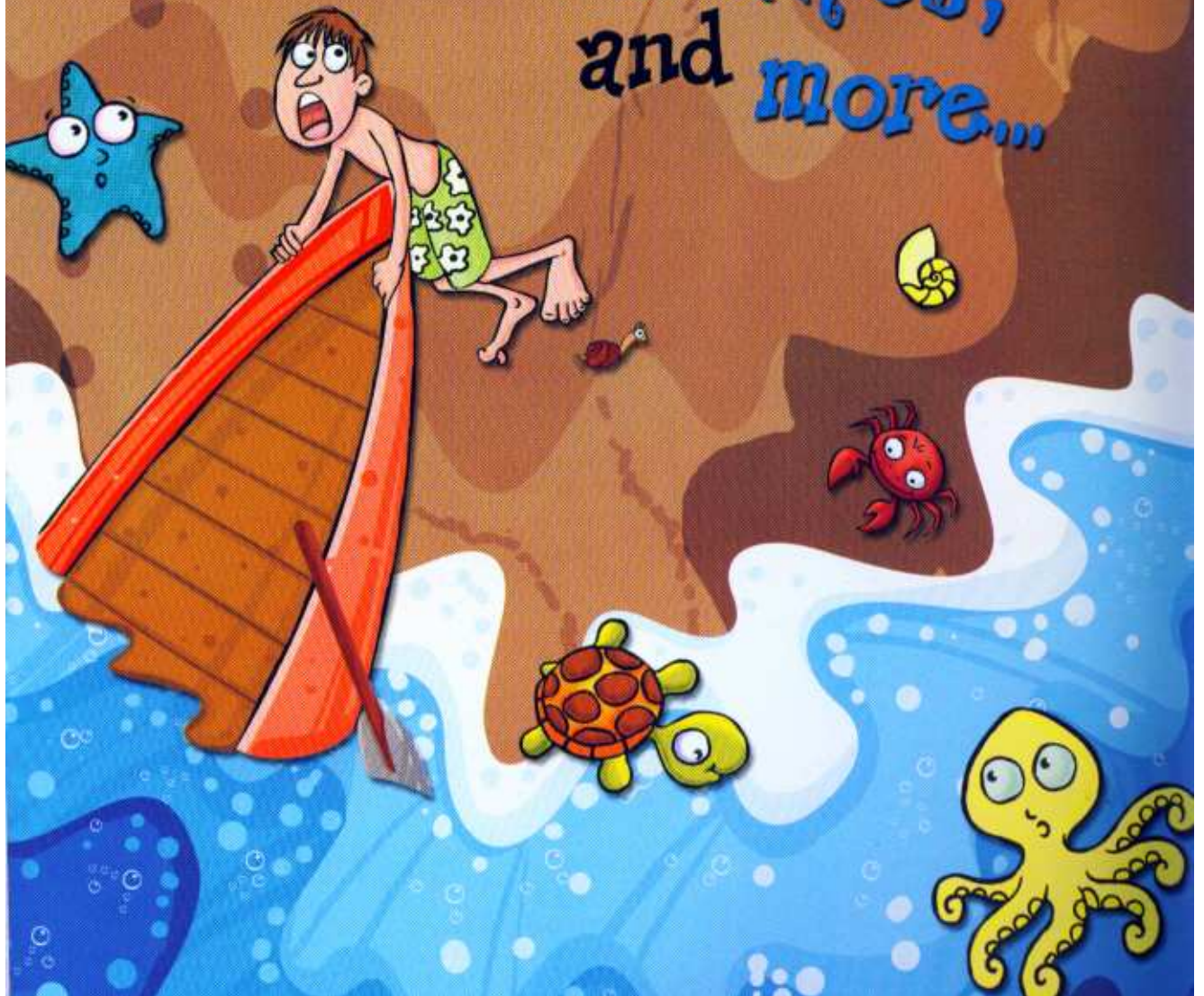
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Illustration: Yatindra Kumar and Vijay Nipane
Production: T Radhakrishnan and Mahfooz Alam

Printed and bound in India

This book is printed on recycled paper



WHAT are
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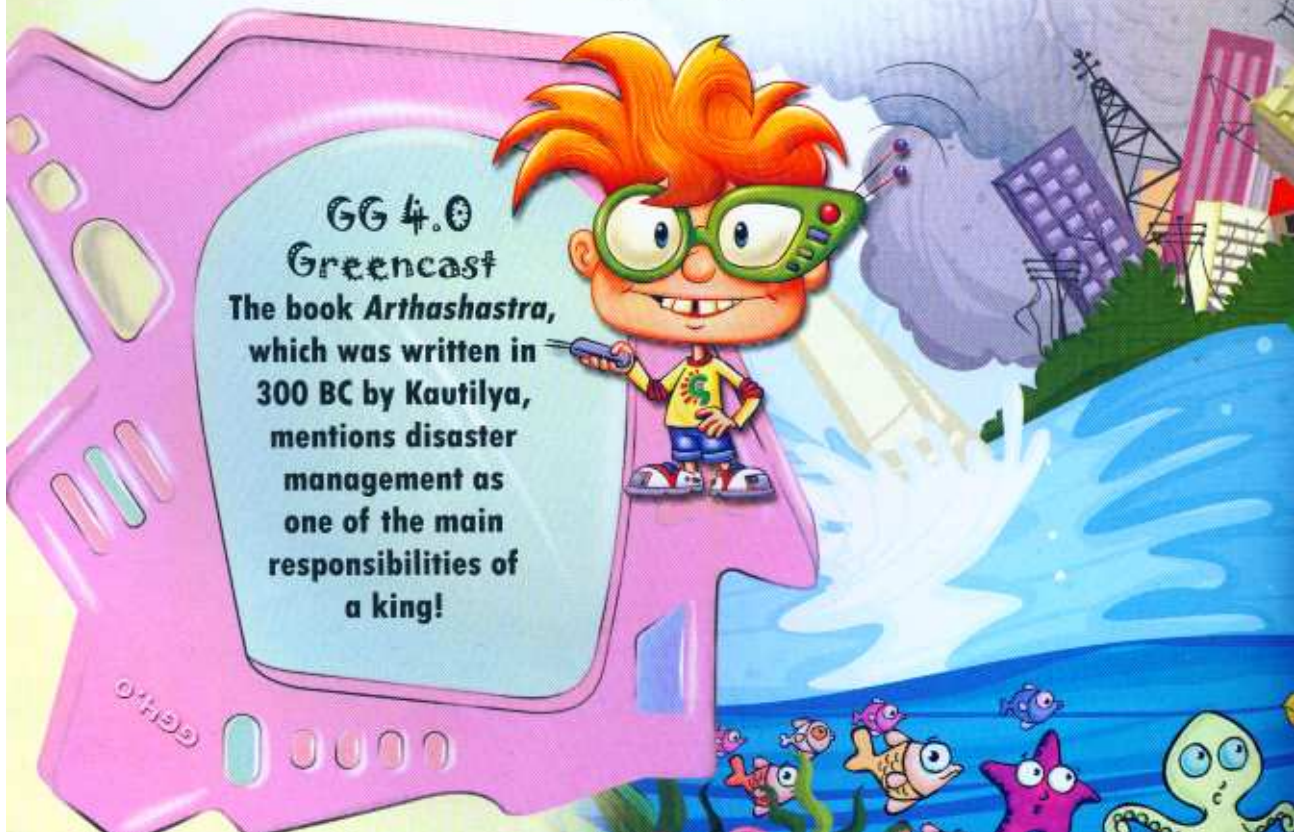


WATCH OUT!



The word 'disaster' comes from a French word 'desastre' and an Old Italian word 'disastro'. It refers to the impact of a natural or man-made event that harms the society or the environment. Thus, in simple terms disaster can be defined as an event that causes loss of life and property.

Scientists are trying to devise ways of accurately predicting natural disasters.



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The book *Arthashastra*, which was written in 300 BC by Kautilya, mentions disaster management as one of the main responsibilities of a king!

Who caused it?

Disasters can be either natural or man-made. Natural disasters include earthquakes, volcanoes, tsunamis, hurricanes, typhoons, cyclones, floods, and so on. Natural disasters are unavoidable. However, man-made disasters such as fires in factories or leakages of harmful gases from industries can be avoided if proper safety measures are taken.

Living with nature

Natural disasters occur suddenly and without warning. It is very difficult to foretell when and where a disaster might occur. But scientists are always looking for ways to predict disasters. They have now devised a way to forecast earthquakes, volcanic eruptions, wildfires, landslides, floods, and hurricanes. They use fractals, a mathematical formula, to study where a disaster might strike next!

Nature is kind, but when disasters strike, people and animals lose their lives and homes.

SHAKE THAT!

Richter
scale

2



4



8



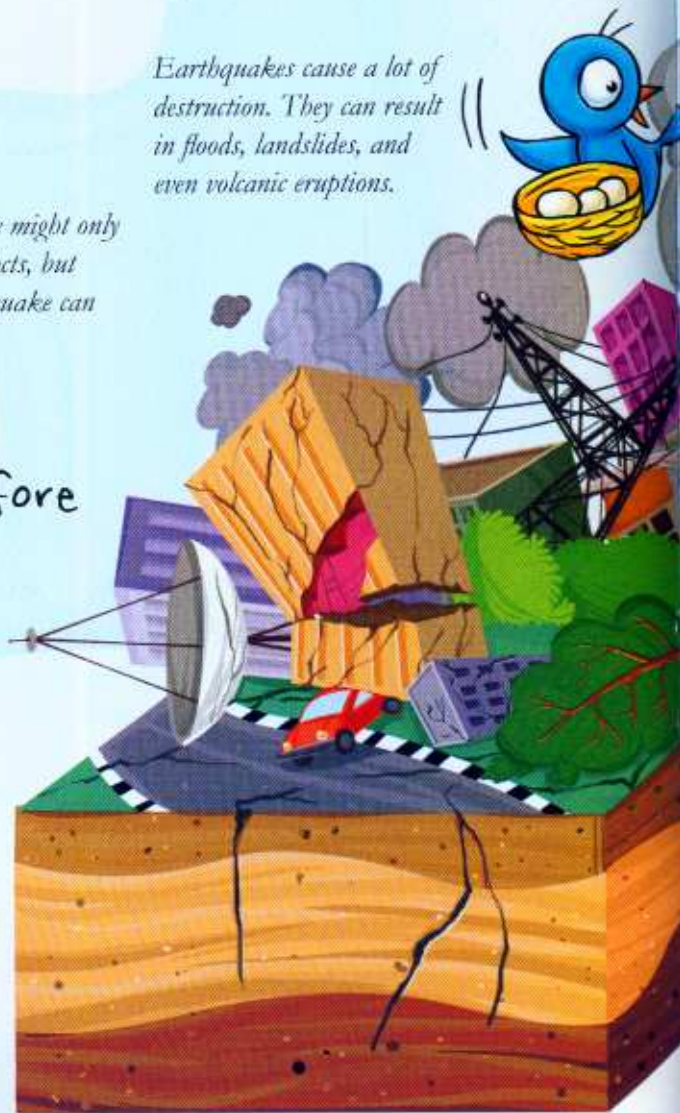
The sudden trembling of the earth is known as an earthquake. The intensity of a quake can vary, from a tremor that people do not even feel to a violent temblor that can bring down a building.

Earthquakes cause a lot of destruction. They can result in floods, landslides, and even volcanic eruptions.

A weak quake might only sway a few objects, but a strong earthquake can destroy cities.

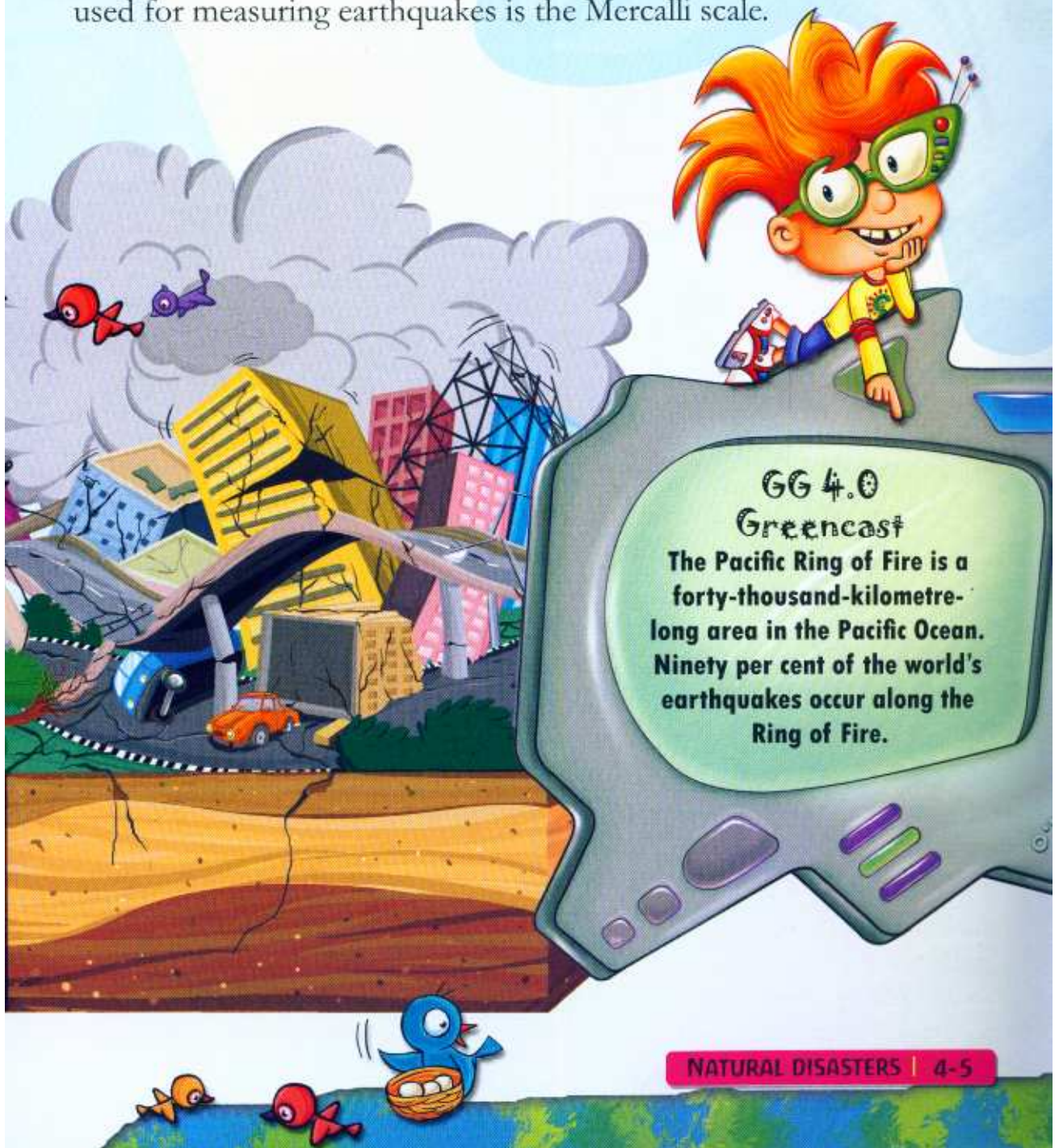
The why and the wherefore

The earth's surface is made up of tectonic plates, arranged much like a jigsaw puzzle. These plates move slowly and continuously past one another. When these plates shrink or stretch or push against one another, the earth above them shakes and trembles, causing the surface of the earth to break or form cracks. This shaking is what we feel as an earthquake.



Quaker shaker!

Earthquakes are measured on the Richter scale. Charles F Richter invented this scale in 1934. Earthquakes below 2 on this scale usually cannot be felt. Earthquakes up to 3 do not cause much damage. Quakes measuring 7 or more are the most dangerous! Another scale used for measuring earthquakes is the Mercalli scale.



FIRE ON A MOUNTAIN

Just like the safety valve in a pressure cooker lets out the pressure inside the cooker, a volcano is an opening on the earth's surface that releases the pressure built up inside it.



What is a volcano?

Most of the world's volcanoes are found on the boundaries of tectonic plates. The temperature beneath the earth's surface is so high that rocks melt and form a molten liquid called magma. This magma, along with ashes and gas, exerts pressure on the earth's surface and is released through openings on the earth's surface. This is called 'eruption'. The mouth of a volcano is called 'crater'.

Hot flowing lava can kill people, animals, and plants. It can destroy entire cities.

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When the lava from volcanoes cools, it forms rocks. These rocks break down to form soil. Volcanic soil is very fertile. In Indonesia, it is in the shadow of active volcanoes that some of the most fertile rice fields are found.



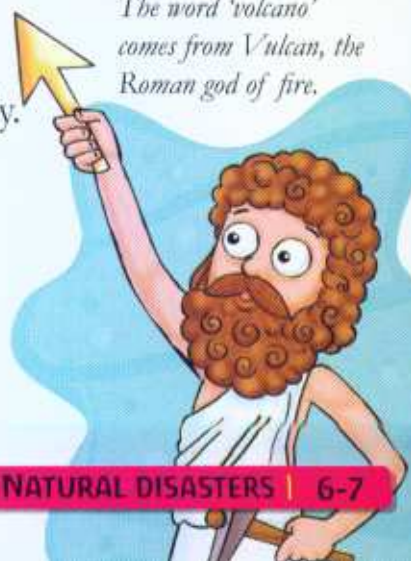


After magma explodes to the surface of the earth, it is known as lava. Lava has a very high temperature, usually about 700–1,200 degree Celsius.

Active and inactive

An active volcano is one that erupts frequently. Kilauea, a volcano in Hawaii, is one of the most active volcanoes in the world. An extinct volcano, like Mount Kilimanjaro, is one that had erupted in the past but is not expected to erupt in the future. A dormant volcano is one that has not erupted for many years but is not extinct, like Mount Vesuvius in Naples.

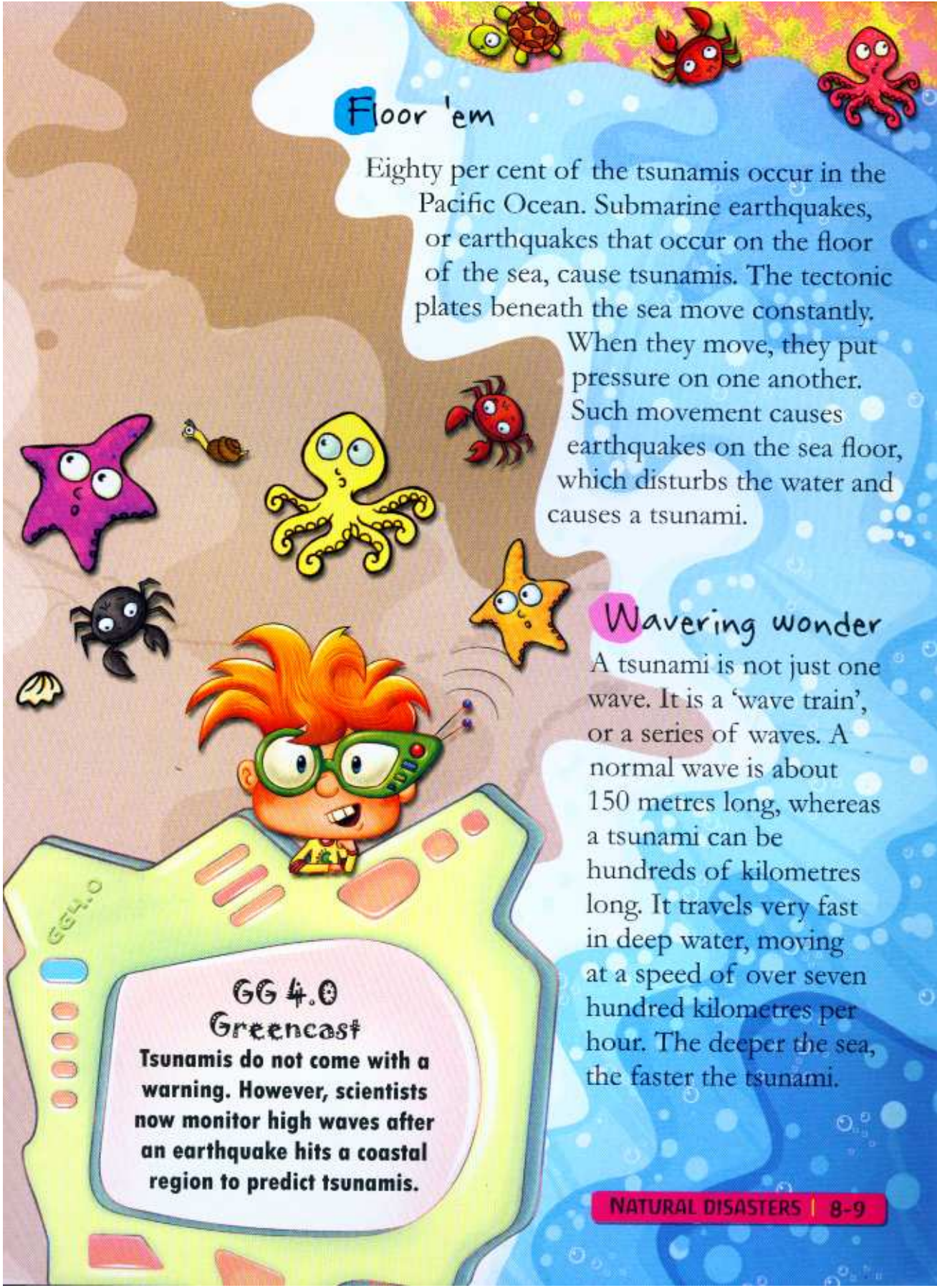
The word 'volcano' comes from Vulcan, the Roman god of fire.



WAVES OF DESTRUCTION

The word 'tsunami' is derived from a Japanese word, that means 'great harbour wave'. It is said that one day some Japanese fishermen, who had gone out to sea, were astounded to find, on their return, that the entire harbour had been washed away by a giant wave. Far out in the ocean, they had not felt a thing!

Even though tsunamis cause a lot of destruction near beaches and shores, they can hardly be felt in the middle of the ocean.



Floor 'em

Eighty per cent of the tsunamis occur in the Pacific Ocean. Submarine earthquakes, or earthquakes that occur on the floor of the sea, cause tsunamis. The tectonic plates beneath the sea move constantly.

When they move, they put pressure on one another. Such movement causes earthquakes on the sea floor, which disturbs the water and causes a tsunami.

Wavering wonder

A tsunami is not just one wave. It is a 'wave train', or a series of waves. A normal wave is about 150 metres long, whereas a tsunami can be hundreds of kilometres long. It travels very fast in deep water, moving at a speed of over seven hundred kilometres per hour. The deeper the sea, the faster the tsunami.

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Tsunamis do not come with a warning. However, scientists now monitor high waves after an earthquake hits a coastal region to predict tsunamis.

ON SHAKY GROUND



A landslide is the movement of large stones, rocks, debris, and boulders down a slope. It is caused when the land in the region around the slope becomes unstable. Landslides usually occur in mountainous areas.



What causes them?

Landslides may occur either due to natural or man-made activities. Natural causes that trigger landslides include the pressure on land by groundwater, earthquakes, volcanic eruptions, rains, floods, and so on.

Human activities that alter the shape of a slope also cause landslides.

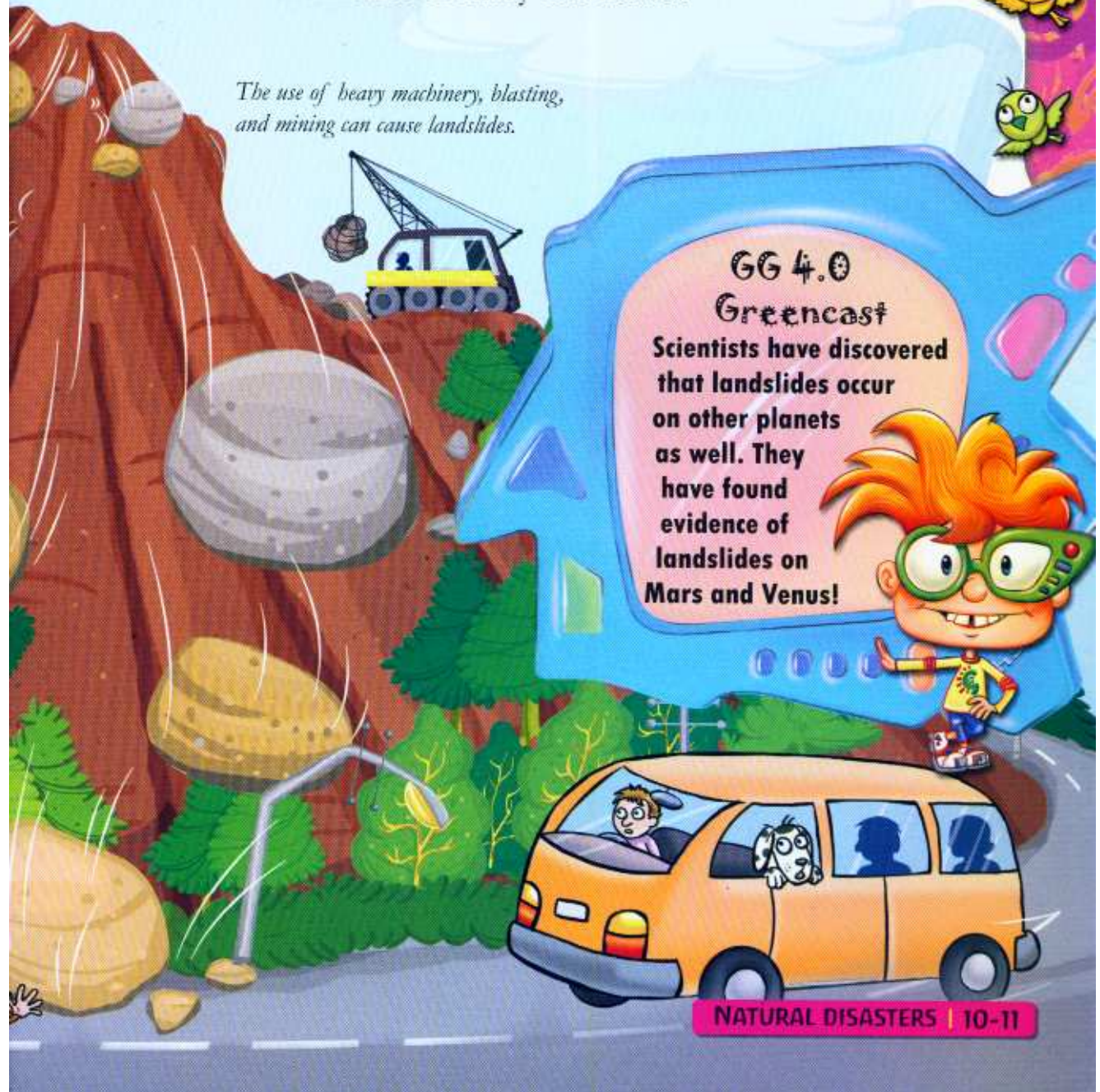
Landslides can cause destruction and deaths. They also cut off transport and communication.



Sliding earth

Some landslides are very slow moving, with small rocks, pebbles or debris falling slowly. But some landslides are very massive and fast moving. These have large rocks or boulders that fall with such force that they can destroy anything that comes in their way. The distance travelled by these rocks and debris varies from a few centimetres to many kilometres.

The use of heavy machinery, blasting, and mining can cause landslides.

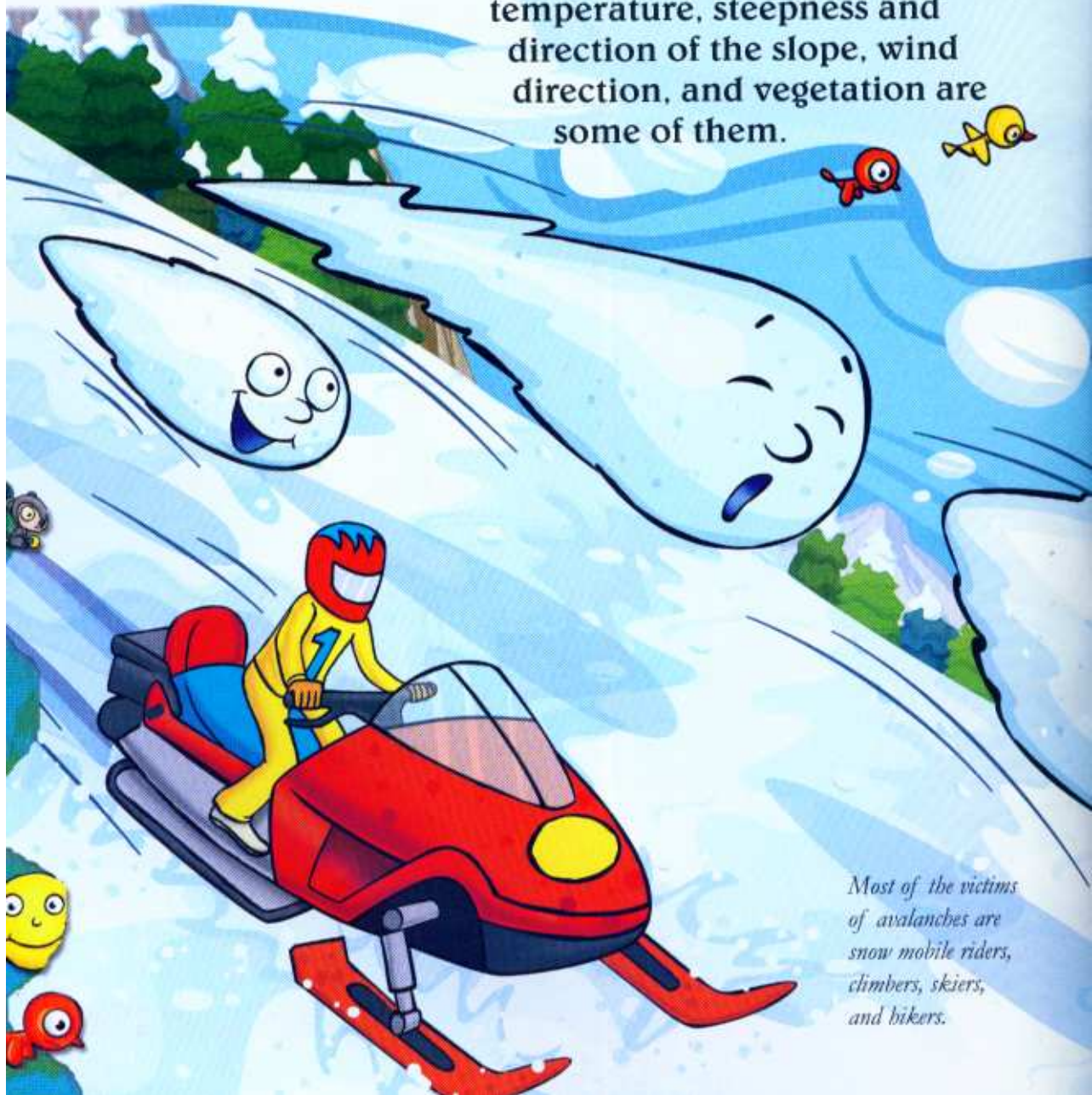


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Scientists have discovered
that landslides occur
on other planets
as well. They
have found
evidence of
landslides on
Mars and Venus!

NOT AS SOFT AS SNOW!



An avalanche is a sudden flow of a large amount of snow or ice down a slope at high speed. In fact, avalanches have been known to move at speeds of over hundred kilometres per hour! Avalanches occur due to many reasons: weather, temperature, steepness and direction of the slope, wind direction, and vegetation are some of them.



Most of the victims of avalanches are snow mobile riders, climbers, skiers, and hikers.

Will it, wont it?

Weak snow layers, wind, snowfall, and rapid warming are known to cause avalanches. But avalanches do not occur every time the wind blows or snow falls or temperature rises. If the layers of snow are solid and stable, chances are that avalanches will not occur.



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On May 31, 1970, the Ancash earthquake caused a large avalanche—the most catastrophic natural disaster in the history of Peru. Every year on May 31, many schools in Peru practise an earthquake drill in memory of the disaster.

Different shades of white!

There are many kinds of avalanches, but the most common and dangerous type is called 'slab' avalanche. In this kind of avalanche, a sheet of snow breaks off with a loud noise, and slides down the slope or mountain. A loose snow avalanche, or 'sluff', occurs when loose snow falls down a slope. This kind of avalanche rarely harms anyone.



FLAME OF THE FOREST



Each year, millions of hectares of forests get burnt when forest fires break out. Such fires set thousands of trees aflame, kill many animals, and destroy hundreds of homes.

Whodunit?

Forest fires occur most often during summer and autumn, when the weather is hot and dry. They are most common in grasslands and scrublands.

Forest fires are usually sparked off by natural causes such as lightning. This lightning triggers a chain reaction that can set the whole forest on fire. Human activities such as a lit cigarette thrown carelessly, a bonfire not put out completely, and electric sparks can also cause a forest fire.

In autumn, the forest floor gets littered with dry leaves and twigs. Even a single spark that falls there can start a fire that can engulf the forest.



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In 1987, forest fires burnt down 650,000 acres of forestland in California and Oregon. These fires were started by dry lightning. This incident is referred to as the Siege of 1987.



S.O.S!

Fire is sometimes necessary for the new growth of forests. In most cases, forest fires lead to the destruction of life and money. Forest fires release dust, soot, and harmful gases into the atmosphere.

Some trees like the ponderosa pine and the bur oak have even devised ways to protect themselves from forest fires. They have a thick, fire-resistant bark.



Genius's Greenreel

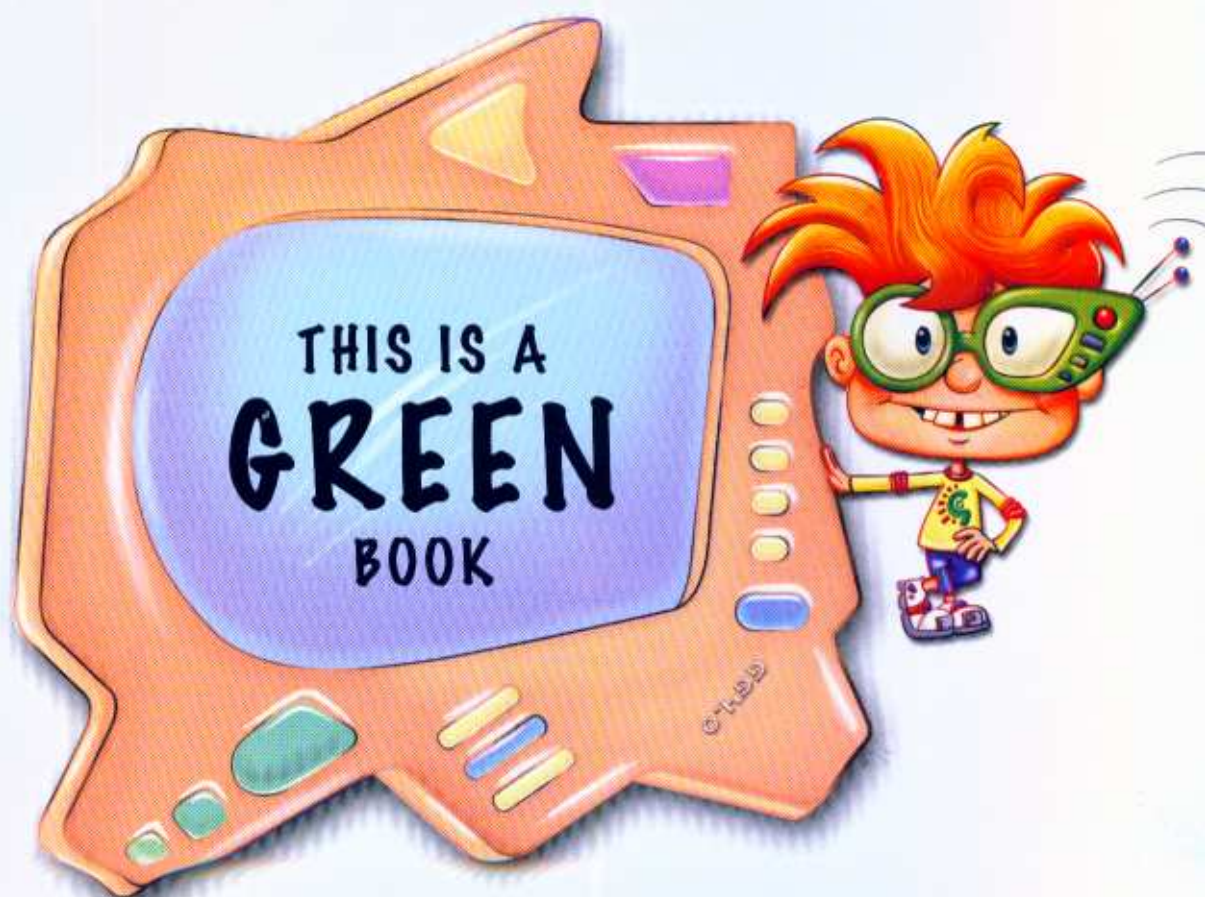
Earthquakes are often linked with disasters related to the sea. Did you know that in Greek mythology too, Poseidon, the god of the sea, possessed the power of 'shaking the earth'.

The first record of a volcano comes from Pliny the Younger. He was sixteen years old when Mount Vesuvius erupted on August 24, AD 79. The lava completely buried the cities of Pompeii and Herculaneum.

The most destructive tsunami ever recorded was the Asian tsunami, on December 26, 2004. After an earthquake measuring 9.3 on the Richter scale along the western coast of Sumatra, the seabed rose by 15 metres along a length of 1,500 kilometres.

Nearly 250,000 avalanches occur in the Alps Mountains, in Europe, every year.

The philosopher Aristotle was one of the first European philosophers to put forward a theory about the origin of earthquakes. He believed that earthquakes were caused by strong winds!



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WHAT are VOLCANOES, EARTHQUAKES, avalanches, and more...

Nature plays no favourites, and natural disasters can strike anywhere, anytime. This book not only tells you about the commonest disasters, but also why they occur, where they occur most often, and their impact on life and landscape.

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ISBN 978-81-7993-159-2



9 788179 931592

MRP Rs 75

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Ages: 8-12